

REMARKS

Applicants thank the Examiner for total consideration given the present application. Claims 1-14 are currently pending of which claims 1, 6, 11, and 13 are independent. Claims 2, 7, 12, and 14 have been amended through this reply. Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

FORM 1449 ACKNOWLEDGMENT REQUESTED

It is noted that the Examiner still did not initial the "Ilder" reference cited under "OTHER DOCUMENTS" on the PTO-1449 filed on July 01, 2001. Accordingly, Applicant respectfully requests that such initialed form be provided.

35 U.S.C. § 112, 2ND PARAGRAPH REJECTION

Claims 2, 7, 12, and 14 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Particularly, the Examiner alleges that it is unclear what is meant by "a clock signal that is determined by a signal frequency."

Initially, Applicants disagree with the Examiner's assertion that the term "a clock signal that is determined by a signal frequency" renders the claims indefinite. Applicants respectfully submit that the Examiner's focus during examination for compliance with the requirement of definiteness in § 112, 2nd paragraph is whether the claim meets the threshold requirements of clarity and precision. To do this, the Examiner needs only ensure that the claims define the invention with a reasonable degree of particularity and distinctness. See MPEP § 2173.02.

Applicants submit that the claims clearly define that the clock signal has a frequency that is determined by the frequency of the data signal. Although Applicants do not necessarily agree

with the Examiner's assertion of indefiniteness, Applicants have amended claim 2, 7, 12, and 14 to include, *inter alia*, “**wherein the frequency of the clock signal is half of a signal frequency of the data signal**” in order to expedite prosecution.

Accordingly, it is respectfully requested that the Section 112, second paragraph rejection of claims 2, 7, 12, and 14 be withdrawn.

35 U.S.C. § 103 REJECTION

A. Claims 1-14 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Martensson et al. (US Pub. No. 2003/0219259 A1) in view of Sasai et al. (US Patent No. 6,459,519 B1). Applicants respectfully traverse this rejection.

For a Section 103 rejection to be proper, a *prima facie* case of obviousness must be established. See M.P.E.P. 2142. One requirement to establish *prima facie* case of obviousness is that the prior art references, when combined, must teach or suggest all claim limitations. See M.P.E.P. 2142; M.P.E.P. 706.02(j). Thus, if the cited references fail to teach or suggest one or more elements, then the rejection is improper and must be withdrawn.

In regard to independent claim 1, Applicants respectfully submit that none of the cited prior art references teaches or suggests, *inter alia*, **a phase modulating unit** (claim 1) or step (claim 11) that “performs phase modulation **on a data signal based on the carrier-suppressed-return-to-zero (CSRZ) signal** to thereby convert the data signal into a phase-modulated signal” and an optical filtering unit (claim 1) or step (claim 11) that “**filters out redundant frequency components included in the phase-modulated signal**”. *Emphasis added.*

Martensson merely teaches a data modulation apparatus including, among other things, a laser source 10, a data modulator 20, and data source 30, a clock 40, and a phase modulator 50 (see Fig. 9). The data modulator 20 modulates data onto an optical signal at a predetermined bit rate wherein the phase modulator 50 modulated the optical signal outputted from the data modulator 20 at a frequency less than one-half of the predetermined bit rate. The data modulator 20 is configured for return-to-zero (RZ) or non-return-to-zero (NRZ) modulation format (see paragraph [0022]) with information from the data source 30. Particularly, Martensson is directed to increase the non-linear tolerance of a transmission system by performing phase modulation at a frequency of a third or less of the predetermined bit rate of a digital data signal (see paragraph [0007]). Martensson discloses that the transmission system may include known transmission links that uses conventional RZ, NRZ, chirped return-to-zero (CRZ), carrier-suppressed return-to-zero (CSRZ) and alternative chirped RZ modulators (see paragraph [0030]).

The Examiner relies on the phase modulator 50 as disclosing a **phase modulating unit** that performs phase modulation **on a data signal based on the carrier-suppressed-return-to-zero (CSRZ) signal** to thereby convert the data signal into a **phase-modulated signal**. Applicants respectfully submit that the phase modulator 50 cannot be properly interpreted as the claimed phase modulating unit. Martensson is distinguished from the claimed invention in that Martensson merely provides a way to enhance transmission performance of CSRZ modulator. However, nowhere does Martensson disclose that the phase modulator 50 modulates on a data signal, outputted from the data modulator 20, based on the CSRZ signal to convert the data signal into a phase-modulated signal, as required by independent claims 1 and 11. As

demonstrated above, the data modulator 20 is only configured to generate encoded RZ or NRZ based on the information of that data source 30. Thus, the phase modulator 50 can only modulates on a data signal based on the RZ or NRZ signal, not CSRZ signal, as recited in claims 1 and 11, to convert the data signal into a phase-modulated signal.

In addition, as acknowledged by the Examiner, Martensson **does not** teach an optical filtering unit that filters out redundant frequency components included in the phase-modulated signal. The Examiner imports Sasai to fulfill the deficiency of Martensson in this regard.

Applicants respectfully submit that Sasai fails to teach an optical filtering unit that filters out redundant frequency components included in the phase-modulated signal. As demonstrated above, the phase-modulated signal of the instant invention is produced by performing phase modulation on a data signal based on the CSRZ signal. Sasai is directed to an optical transmitter-receiver that merely uses a conventional optical filter 130 to filter out an upper sideband or a lower sideband components of a double-modulated optical signal (modulated carrier MC signal) (see col. 19, lines 50-55). The entire reference is silent on whether the optical filter 130 filter outs the upper sideband or the lower sideband components of a **phase-modulated signal** wherein the phase-modulated signal is produced by performing phase modulation on a **data signal based on the CSRZ signal**. The Examiner relies on the optical modulating portion 120 of Sassai to allege that the optical modulating portion 120 modulates a data signal based on the CSRZ signal. Applicants respectfully disagree. As taught by Sassai, the optical modulating portion 120 merely modulates a carrier MC signal (see Abstract). Thus, it is respectfully submitted that Sassai cannot teach the claimed “optical filtering unit or step”.

Accordingly, it is respectfully submitted that independent claims 1 and 11 are distinguishable over Martensson and Sasai.

Independent claims 6 and 13 recite, *inter alia*, **a signal carrier-suppressed pulse modulating unit** (claim 6) or step (claim 13) that “**performs signal carrier-suppressed pulse modulation on the phase-modulated signal to thereby convert the phase-modulated signal into a phase modulated carrier-suppressed-return-to-zero signal**” and an **optical filtering unit** (claim 6) or step (claim 13) that “**filters out redundant frequency components included in the phase modulated carrier-suppressed-return-to-zero signal.**” As demonstrated above in great details with respect to claims 1 and 11 that neither Martensson nor Sasai can teach at least the above-identified claim features of independent claims 6 and 13.

B. Another requirement to establish prima facie case of obviousness is that there must be a suggestion or motivation within the cited reference(s) to modify the reference(s) as proposed in the Office Action. See M.P.E.P. 2143.01. The cited reference must be considered in its entirety including disclosures that teach away from the claimed invention. See M.P.E.P. 2141.02. If the cited reference(s) teach away from the claimed invention, then the combination is improper and the rejection must fail.

In this instance, even if, assuming *arguendo*, Sassai teaches an optical filtering unit as claimed, which Applicants disagrees for the reasons stated above, the combination of Martensson and Sasai will fail because Martensson requires performing phase modulation at a frequency equal to $1/n$ of a data bit rate, where n is an integer > 2 . Thus, application of Sassai's filter 130, which filter outs lower sideband ($v-f_0$) or upper sideband ($v+f_0$) of a modulated signal (see Figs.

2 and 4 of Sassai), into the RZ or NRZ modulated signal of Martensson will destroy the performance of Martensson's transmission system because Martensson clearly discloses that advantageous result is obtained when phase modulation is performed using a waveform having a frequency of $\frac{1}{4}$ of the data bit rate (see paragraph [0009] of Martensson).

Therefore, for at least these reasons, independent claims 1, 6, 11, and 13 are distinguishable from the combination of Martensson and Sasai.

C. Dependent claims 2-5, 7-10, 12, and 14 are at least allowable by virtue of their dependency on corresponding allowable independent claim and further in view of novel features recited therein. For example, Martensson does not teach "**wherein the frequency of the clock signal is half of a signal frequency of the data signal**" as recited in amended claims 2, 7, 12, and 14. Martensson teaches that the clock 40 is coupled to a frequency divider 80, which divides the clock frequency by an integer n , where n is an integer > 2 (see paragraph [0022]).

Further, it is also respectfully submitted that the Examiner is improperly taking "Official Notice" on 3, 4, 8, and 9 as being well known in the art. Applicant respectfully points the Examiner to MPEP 2144.03 regarding "Official Notice" which states:

It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the **facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known**. . . .

If applicant adequately traverses the examiner's assertion of official notice, **the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained**. See 37 CFR 1.104(c)(2). . . .

If the examiner is relying on personal knowledge to support the finding of what is known in the art, **the examiner must provide an affidavit or declaration** setting forth specific factual statements and explanation to support the finding. See 37 CFR 1.104(d)(2). . . .

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the examiner should clearly indicate in the next Office action that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate. **If the traverse was inadequate, the examiner should include an explanation as to why it was inadequate.**

It is respectfully submitted that the subject matter of claims 3, 4, 8, and 9 are **not capable of instant and unquestionable demonstration as being well-known**. For example, claims 3 and 8 recite, *inter alia*, "an optical combining unit that *wavelength-multiplexes the optical output signals output from the optical modulation processing units*" and claims 4 and 9 recite, *inter alia*, "*a differential coding unit that performs differential-coding on the data signal.*" As demonstrated above, the instant claims require that the optical modulation processing units modulate data signal based on a **carrier-suppressed-return-to-zero signal**. Thus, Applicants respectfully request the Examiner to withdraw the "Official Notice" taken against claims 3, 4, 8, and 9 and provide specific references in support of the rejection.

CONCLUSION

In view of the above response, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Ali M. Imam Reg. No. 58,755 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


Application No. 10/609,366
Amendment dated May 30, 2007
Reply to Office Action of September 6, 2006 March 12, 2007

Docket No : 2611-0192P

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: May 30, 2007

Respectfully submitted,

By  #58,755
for D. Richard Anderson
Registration No.: 40,439
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant